

WHAT IS CLAIMED IS:

- [c1] A reflection type display apparatus comprising:
a reflection type display panel having a reflection plane used to reflect thereon light entered from a forward direction; and
a forward lightening apparatus arranged in front of said reflection type display panel; wherein:
light which is entered from said forward lightening apparatus into said reflection type display panel is entered into said reflection type display panel along a direction different from a direction of external light entered into said reflection type display panel; and
both the light which is derived from said forward lightening apparatus and is reflected on said reflection plane, and said external light which is reflected on said reflection plane are projected along the substantially same reflection direction.
- [c2] A reflection type display apparatus as claimed in claim 1 wherein:
said reflection plane is subdivided into both a first region capable of reflecting thereon light which is obliquely entered from said forward lightening apparatus along said reflection direction, and a second region capable of reflecting thereon external light which is entered at a substantially right angle along said reflection direction.
- [c3] A reflection type display apparatus as claimed in claim 1 wherein:
said reflection plane is comprised of:
a first region on which a concave/convex pattern is formed, said concave/convex pattern reflecting thereon light which is obliquely entered from said forward lightening apparatus along said reflection direction; and
a second region on which another concave/convex pattern is formed, said concave/convex pattern reflecting thereon external light which is entered at a

substantially right angle along said reflection direction.

- [c4] A reflection type display apparatus as claimed in claim 1 wherein:
said reflection plane owns substantially no such a region located in parallel to a front surface of said reflection type display panel.
- [c5] A reflection type display apparatus as claimed in claim 3 wherein:
a normal line stood on an averaged inclined plane of said concave/convex pattern formed on said first region is inclined from a direction perpendicular to the reflection plane toward a light source direction of said forward lightening apparatus.
- [c6] A reflection type display apparatus as claimed in claim 1 wherein:
both a luminance center of light which is derived from said forward lightening apparatus and is reflected on said reflection plane, and another luminance center of external light which is reflected on said reflection plane are collected at a predetermined position in front of said reflection type display panel.
- [c7] A reflection type display apparatus as claimed in claim 1 wherein:
said forward lightening apparatus is comprised of: a light source for projecting light; and a light conducting plate for confirming incident light in the own light conducting plate and for propagating said confined light through the own light conducting plate.
- [c8] A reflection type display apparatus as claimed in claim 1 wherein:
said forward lightening apparatus is comprised of: a light source for projecting light; and a directivity controlling unit for controlling directivity of light projected from said light source.
- [c9] A reflection type display apparatus as claimed in claim 7 wherein:
a thickness of an edge portion of said light conducting plate, which is

located far from said light source, is made thinner than a thickness of a portion of said light conducting plate, which is located in the vicinity of said light source.

[c10] A reflection type display apparatus as claimed in claim 9 wherein:

both a front surface and a rear surface of said light conducting plate are formed under smooth condition.

[c11] A reflection type display apparatus as claimed in claim 7 wherein:

a front surface of said light conducting plate is made smooth; and
a pattern inclined in such a manner that a thickness of said light conducting plate on the side located far from said light source becomes thin is repeatedly formed on a rear surface of said light conducting plate.

[c12] A reflection type display apparatus as claimed in claim 7 wherein:

a rear surface of said light conducting plate is optically adhered to said reflection type display panel; and
a low refractive index layer is formed between said light conducting plate and said reflection type display panel, the reflective index of said low refractive index layer being larger than a refractive index of air and smaller than a refractive index of said light conducting plate.

[c13] A reflection type display apparatus as claimed in claim 12 wherein:

a thickness of said light conducting plate becomes thin in accordance with a position where said light conducting plate reaches close to said light source within a region close to the light source.

[c14] A method for manufacturing the reflection type display apparatus recited in claim 1, wherein:

ultraviolet hardening type resin is supplied onto a board; and under such a condition that said ultraviolet hardening type resin is sandwiched between a

stamper having an inverted pattern of a reflection plane and said board, ultraviolet rays are irradiated to said ultraviolet hardening type resin so as to harden the ultraviolet hardening type resin, and then to transfer the inverted pattern of said stamper to said ultraviolet hardening type resin.

[c15] A method for manufacturing the reflection type display apparatus recited in claim 1, wherein:

under such a condition that resin supplied onto a board has not yet been hardened, or is softened, said resin is sandwiched between a stamper having an inverted pattern of a reflection plane and said board and then is depressed so as to transfer the inverted pattern of said stamper to said resin.

[c16] A reflection type display apparatus as claimed in claim 1 wherein:

while liquid crystal is sealed within said reflection type display panel, said liquid crystal display panel produces an image by utilizing a characteristic of said sealed liquid crystal.

[c17] A portable telephone comprising:

a dial unit for setting a transmission destination; and
a display unit with employment of the reflection type display apparatus recited in claim 1.

[c18] A portable information terminal comprising:

an input unit used to input data, or a command; and
a display unit with employment of the reflection type display apparatus recited in claim 1.

[c19] A portable type computer comprising:

input/output means; and
a display unit with employment of the reflection type display apparatus

recited in claim 1.

[c20] A television comprising:

turning means; and

a display unit with employment of the reflection type display apparatus
recited in claim 1.

[c21] An electronic appliance comprising:

a display unit with employment of the reflection type display apparatus
recited in claim 1; and

an electronic circuit connected to said display unit.

In a light reflecting method of a reflection type display apparatus equipped
with a reflection type display panel having a reflection plane used to reflect
thereon light entered from a forward direction, and a forward lightening apparatus
arranged in front of said reflection type display panel, said light reflecting method
comprising:

a step for entering light which is entered from said forward lightening
apparatus into said reflection type display panel into said reflection type display
panel along a direction different from a direction of external light entered into said
reflection type display panel; and

a step for projecting both the light which is derived from said forward
lightening apparatus and is reflected on said reflection plane, and said external
light which is reflected on said reflection plane along the substantially same
reflection direction.